

PATENT CLAIMS

1. A motor vehicle electrical system, comprising a generator (120), a battery (150), a starter (110) and a high-capacity capacitor (400) for storing electric energy for the starting process of a motor vehicle engine, comprising a voltage transformer (310) and an interrupter (320) which are connected in parallel between the capacitor (400) and the battery (150) and are controlled for preparing a starting process of the motor vehicle engine in such a way that the voltage transformer (310) transforms the voltage (U_{Batt}) of the battery (150) into a larger voltage and the interrupter (320) interrupts the electrical connection between the battery (150) and the capacitor (400).
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2. A motor vehicle electrical system according to claim 1, wherein the voltage (U_{Batt}) of the battery (150) in a charged state is within the range of approximately 12.5 V and the voltage transformer (310) increases the voltage (U_{Batt}) of the battery (150) by several volts to preferably approximately 16 V.
3. A motor vehicle electrical system according to claim 1 or 2, comprising a control unit (440) for activating the voltage transformer (310) and for opening the interrupter (320).
4. A motor vehicle electrical system according to claim 3, wherein the control unit (440) effects an activation of the voltage transformer (310) and an opening of the interrupter (320) for a short time prior to the start of the starting process of the motor vehicle engine for charging the capacitor (400).
5. A motor vehicle electrical system according to claim 3 or 4, wherein the control unit (440) activates the voltage transformer (310) and opens the interrupter (320) in dependence on the detection of an open state of a vehicle door.
6. A motor vehicle electrical system according to claim 5, wherein the control unit (440) is connected to a sensor for detecting the open/closed state of the vehicle door.

7. A motor vehicle electrical system according to one of claims 3 to 6, wherein the control unit (440) activates the voltage transformer (310) and opens the interrupter (320) in dependence on the detection of the position of the ignition key.
8. A motor vehicle electrical system according to claim 7, wherein the control unit (440) activates the voltage transformer (310) and opens the interrupter (320) upon the detection of the ignition key position "ignition ON".
9. A motor vehicle electrical system according to one of claims 4 to 8, wherein the control unit (440) deactivates the voltage transformer (310) while the interrupter (320) is open, as soon as the starting process of the motor vehicle engine is initiated.
10. A motor vehicle electrical system according to one of claims 4 to 9, wherein the control unit (440) closes the interrupter (320) as soon as the starting process was successfully terminated.
11. A motor vehicle electrical system according to claim 10, wherein the control unit (440) monitors the voltage of the generator (120) and closes the interrupter (320) in dependence on the voltage level of the generator (120).
12. A method for starting a motor vehicle engine with a motor vehicle electrical system, comprising a generator (120), a battery (150), a starter (110) and a high-capacity capacitor (400) for storing electric energy for the starting process of the motor vehicle engine, comprising the steps:

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detecting an imminent starting process during which the motor vehicle engine is put into operation by means of the starter (110),

charging the high-capacity capacitor (400), wherein

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an electrical connection between the battery (150) and the high-capacity capacitor (400) is interrupted, and

15 the voltage (U_{Batt}) of the battery (150) is transformed by a voltage transformer (310) into a higher voltage, and

supplying the starter (110) with energy from the high-capacity capacitor (400) for starting the motor vehicle engine.

13. A method according to claim 12, wherein an open state of a vehicle door is detected for detecting an imminent starting process.
14. A method according to claim 13, wherein an open state of the driver's door is detected.
15. A method according to one of claims 12 to 14, wherein the position of the ignition key is detected for detecting an imminent starting process.
16. A method according to claim 15, wherein the ignition key position "ignition ON" is detected.
17. A method according to one of claims 12 to 16, wherein the transformation of the voltage (U_{Batt}) of the battery (150) to a higher value is terminated as soon as the starter (110) is activated.
18. A method according to one of claims 12 to 17, wherein the battery (150) is electrically connected to the generator as soon as the motor vehicle engine runs by itself.
19. A method according to claim 18, wherein it is detected in dependence on the voltage level of the generator (120) whether the motor vehicle engine runs by itself.